isnar Briefing Paper NO. 53
International Service for National Agricultural Research
September 2002

DEFENSIVE PUBLISHING: A STRATEGY FOR MAINTAINING INTELLECTUAL PROPERTY AS PUBLIC GOODS

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Public research institutions must consider means to ensure that the products of their work will remain accessible to their beneficiaries. One such means is "defensive publication." In a defensive publication, the scientists disclose details about their innovation to the public, thereby preserving their freedom to use the innovation by preventing others from patenting it. The link between defensive publication and patenting is the requirement for novelty in a patent application. Since a defensive publication makes a description of the innovation available publicly, the innovation can no longer be called new and thus patent-worthy.

For agricultural researchers in the public sector, defensive publication serves two purposes: it is a means to both communicate results to others and to forestall an eventual patent award on the innovation described, hence preserving the research product as a public good. If the defensive publication is made widely available, the invention could be considered a public good internationally. Defensive publishing is just one of a range of tools that enable scientists and research enterprises to exploit their intellectual property effectively. Indeed, it should not be used alone, but rather as part of an institutional strategy for management of intellectual property assets. All research organizations, large or small, regardless of location, should have such a strategy in place.

This Briefing Paper first introduces the practice of defensive publication. It then reviews the concept of novelty, which is at the center of the use of defensive publishing to preclude patenting. The paper then describes the various options available for defensive publishing and discusses the strengths and weaknesses of each. The conclusion presents a table that research managers can use to aid decisions on defensive publishing—both forms and methods.

A Short Guide to Defensive Publication

Scientific research generates "intellectual property" (IP), that is, new knowledge and ideas belonging to the individual creators who did the research or the enterprises that funded the work. A range of strategies are available to enable scientists and research enterprises to exploit their IP effectively. One such strategy in use by national and international research institutes and private entities is "defensive publication." While not suitable in all circumstances or for all types of research outcomes, defensive publication can be an effective way to disseminate scientific

ISSN 1021–2310

results in order to preserve the results as a public good. In addition, some forms of defensive publication enable the scientist/innovator to maintain some control over the use of their results or invention.

In a defensive publication, the scientists disclose details about their innovation to the public, thereby preserving their freedom to use the invention by preventing others from patenting it. The link between defensive publication and patenting is the requirement for novelty in a patent application. Since a published description of the research product is available, it can no longer be called new and thus patent-worthy. This is how defensive publishing effectively prevents competitors (and possibly even the originating scientist) from patenting an identical or similar innovation.

The defensive publication route is especially useful for innovations that do not warrant the high costs incurred in patent applications but to which scientists do want to retain access. It is especially useful for agricultural researchers in the public sector, since it is not only a means by which they can communicate results to others. But, when done properly, it serves the additional purpose of forestalling eventual patent awards on the research product described, hence preserving the innovation as a public good.

Commercial companies too are fast adopting defensive publishing as a key element of their IP management strategy. According to Richard Poynder's analysis in the *Financial Times*,[1] as the costs of patent applications and litigation continue to rise defensive publishing is offering scientists another option: by making published descriptions of their innovative research products available to the public, they prevent others from patenting them, thus they ensure the results' continued availability without incurring the significant legal and filing fees involved in patenting.

Literature searches are typically a main element of patent grant procedures. Lack of published documentation on an innovation—or lack of such documentation in the literature traditionally reviewed by patent examiners[2]—may indicate to a patent examiner that the innovation is indeed new and worthy of patent protection. Even older innovations might be judged patent-worthy if a search reveals no published record of the invention. In one case, Indian activists challenged the 1995 award of patent rights over products traditionally derived by local communities from the spice turmeric, persuading the US Patent and Trademark Office to revoke the patent by pointing out literature referring to the "invention" published previous to the patent application date. Effective defensive publication thus can keep innovations out of the private domain and open for use by scientists both in the developing and the developed world, without fear of patent infringement on their part or on the part of the end-users of their products.

This Briefing Paper looks at defensive publishing as an IP management strategy that is particularly relevant for agricultural researchers working in the public sector. The first section examines the concept of "novelty," which is at the heart of defensive publishing strategies. The second section reviews some elements that make up an effective defensive publication. A third section describes some routes to defensive publishing for achieving different ends. The final section concludes with a table that research managers can use to aid decisions on defensive publishing—both forms and methods.

Patents and Publication: The Concept of "Novelty"

Patents are usually considered a "strong" form of intellectual property rights in that the holder, who may be the inventor(s) or an institution to which rights have been assigned, is given a well defined, absolute monopoly on a research product or innovation for a limited period. If the state is to award such strong rights, it is only reasonable that the applicant must satisfy demanding criteria before the grant is made.

One of these criteria is that the invention be "new." Clearly this condition can be satisfied only if everyone concerned—the applicant, their competitors, the patent office, the courts—is working to the same definition of "newness," at least within the country for which patent protection is sought.

A typical definition is that used by the European Patent Office, which appears in the European Patent Convention as follows:

> *An invention shall be considered to be new if it does not form part of the state of the art.*

Admirably simple, but it begs the question, "What is the state of the art?" Fortunately, the next section of the convention addresses this question:

> *The state of the art shall be held to comprise everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application.*

1. In "On the defensive about invention" by Richard Poynder, published in the *Financial Times* of September 19, 2001, available on the *Financial Times*' website (as of August 15, 2002) at http://news.ft.com/ft/gx.cgi/ftc?pagename=View&c=Article&cid=FT3A608ETRC&live=true&query=poynder
2. Patent examiners are the people in patent offices that examine and make recommendations on patent applications regarding statutory requirements such as novelty, nonobviousness, utility, and fulfilment of requirements, such as swearing to the truthfulness of inventorship.

This type of definition is often referred to as "universal novelty." Put simply, *any* printed or electronic publication that fully describes an invention and was *published before* the filing date of a patent application can disqualify that patent from being granted.

Other jurisdictions define novelty in a more restricted manner. For example, US patent law, Code 35, Section 102, defines novelty in a negative sense:

> *A person shall be entitled to a patent unless*
>
> *(a) the invention was known or used by others in this country or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patents, or*
>
> *(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or…*

Note that in this definition, too, an innovation for which a patent application is made cannot have been patented or described in a printed publication, although here a grace period of one year is allowed. During this grace period the innovator may still file a patent application on the innovation, even though during the period it might have been described in a publication or a patent granted for it elsewhere. As of April 1, 2002, 39 countries, including Canada, Japan, and the USA, had established a patent system having a grace period allowing an innovation to have been described in print without breaking the novelty requirement.[3]

Prior art: threat or opportunity?

A publication that forms part of the state of the art (i.e., was available to the public before the patent application date) is often referred to as being "prior art" in relation to a specific patent application. Note that this definition does not mention *who* published a piece of prior art—it can just as easily be the patent applicants themselves as well as an independent third party. Note also that the same publication may be prior art to one patent application but not to another. This hinges on *when* the information is made available to the public and the patent application date.

Thus, for a patent-filing organization any publicly available matter (such as a publication) could potentially block the obtainment of a patent. To that extent, publication is a *threat*. It is extremely important that no informational matter (results, conference poster sessions, formal reports) relating to a patentable invention reaches the public domain until after the inventing organization has filed its patent application. Failure to control leakage of such information could result in the innovators' own information jeopardizing the chances of obtaining a patent, just as effectively as would a publication from an equivalent or competing organization.

Yet this very same criteria of absolute novelty offers an *opportunity* as well: a research organization can use its intellectual property to prevent others from obtaining proprietary rights over the same matter. By deliberately ensuring that certain information is made available to the public, an organization can be certain that no-one is able to satisfy the novelty requirement and hence that no-one is able to patent and subsequently control the use of a research finding or product.

In addition to such passive publication, patent laws in some countries enable organizations to play an active part in the patent-granting process. For example, the European Patent Convention enables a third party to "make observations concerning the patentability" of an innovation before the patent is granted. That means anyone who is aware of a piece of prior art that could bar the patentability of an invention may write to the European Patent Office to bring the prior art to its attention. This is especially useful if some known prior art does not appear in the patent office's official search report,[4] because it ensures that the office will consider the prior art during its examination.

What Makes a Good Defensive Publication?

Organizations that want to take the defensive publication route should follow certain guidelines on how they publish. Five areas for special consideration are form, accessibility, timeliness, unambiguous publication date, and the rights arising from a disclosure. Attention paid to each of these areas, explained below, can determine the difference between a well or poorly prepared publication for the purposes of it serving as a defensive publication.

Form

The most effective form of publication for blocking patentability is one that contains *a complete and comprehensive description of the entire innovation or concept.* A partial description, or one that covers only some aspects of the innovation in an eventual patent application, will not be as effective in preventing the patent grant. The disclosing organization may have preferences as to the medium (e.g., electronic or paper format) or the language used, and it might have restrictions on the total

3. This area, as with other aspects of patent law, is evolving. For a description and discussion of grace periods, see the Australian IP office website (www.ipaustralia.gov.au/patents/P_grace.htm).
4. European Patent Office search reports can be found through the office's website (http://ep.espacenet.com/). Documents listed with the heading A1 or A3 contain the search report for a particular patent application.

cost it is prepared to incur in making the disclosure. The organization must, however, be able to verify that the disclosure has remained consistently available in the same form since its original publication. This is especially significant when considering Web-based means of publication.

Further, the text of the publication should include a section devoted to *the use of the research product or innovation*, both those uses that have been shown to work or for which the author has data, as well as speculation about possible other uses or applicability of the described innovation. In their famous letter to the journal *Nature*, Watson and Crick described their suggestion for the structure of DNA, and they also speculated about the usefulness of this structure for the replication of DNA.[5] By suggesting ideas or concepts (even those that have not been substantiated by experimental data) for improving upon their research product, the scientists/authors can propose defensive publication content that would prevent someone else from claiming a new invention based on the information in the publication. (However, authors should refrain from statements that would indicate that certain innovations or ideas will not work.)

Accessibility[6]

A key aspect of the definition of "'state of the art" is that *the publication must be made available to the public.* This may seem straightforward, but legal cases have wrangled over whether, for example, a university thesis is actually publicly available. To be effective as a defensive publication there must be no doubt that the material is open to public inspection. It must be placed in literature that can be easily located by people doing research in the same field and *especially* by the patent office examiners (if the document is to serve the purpose of prior art).

Timeliness

As noted above, a publication can be prior art to one patent application but not to another, depending on the relative dates of the disclosure and the patent filings. It is obviously important that an organization wanting to create a defensive publication be able to do so at the optimum time. At one point, there may be reason to maintain internal confidentiality so as to delay publication. But at another time, circumstances might call for the *material to be brought to the public quickly and/or predictably*. Organizations therefore need to know the lead times associated with each of the various methods of publication.

Unambiguous publication date

In addition to controlling the timeliness of publication, it is important to be able to *prove the date on which the publication was disclosed to the public.* As with accessibility, patent litigation has hinged on exactly when a publication became available and hence when it could be regarded as part of the state of the art. Whichever type of publishing is used, it should ensure that this unambiguous publication date is established.

Rights

An effective form of defensive publication will serve to block all patenting efforts, including those of the original owner of the intellectual property described in the publication. However, there are some forms of defensive publication (described in the next section) that allow the originator to defer this surrender of property rights, or even to partially retain rights. In addition, certain other rights—notably copyright and database rights—may be created in the act of publication itself and may be retained by the originating organization.

Routes to Defensive Publication

There are essentially two mechanisms by which information can be revealed in a defensive publication. The first is for the creating organization to do all the work of publishing. The second is to disclose the information through a third party.

Self-publishing

Generally speaking, the major advantage of self-publication is that it retains for the publishing organization complete control over form and timeliness of the disclosure. The originator also retains any copyright on the publication itself. However, other aspects may make it less satisfactory. The paragraphs below introduce some of the main forms of self-publishing and the strengths and weaknesses of each.

Company publicity materials. Most companies and organizations have well established mechanisms by which they publish news about their activities. For many years, the annual report was the favorite route. But this is fast being supplemented by the use of the corporate website as a contact point for press releases and more substantial documents. Although both of these outlets give the organization complete control over content and form, and good control over timeliness, they are less effective in ensuring accessibility and in establishing an unambiguous publication date. Websites, in particular,

5. This was called "The Great Understatement" in a commentary by Tom Zinnen on J.D. Watson and F.H.C. Crick's 1953 article: "A Structure for Deoxyribose Nucleic Acid." The commentary is available on the Web (as of August 15, 2002) at www.accessexcellence.org/AB/BC/casestudy2.html. Data concerning the replication of DNA was not experimentally shown until 1957.
6. Accessibility is not to be confused with "enablement." Accessibility means that information on the invention is available. Yet often an invention cannot be practiced on the basis of information alone. A particular plant variety, for example, cannot be reproduced on the basis of information only, without having access to the genetic material (usually in the form of seed) itself.

tend to be poorly documented. Simply saying "It was on our website" is unlikely to be sufficient to establish an exact date of first public availability or to guarantee that a document was available continuously in the same form and in the same place since that time. Furthermore, although competing organizations frequently monitor each other's websites *they are not routinely used in the search for prior art by patent examiners.*

Company report series. One of the earliest examples of a company laying open material in defensive publication was the International Business Machines in its *IBM Technical Disclosure Bulletin.* Similar house journals are the *Bell Laboratory Record, Siemens Zeitschrift,* and *Xerox Disclosure Journal.* The advantage of such regular publication series is that they gradually become established as important supplemental sources of literature and fulfill the criteria of accessibility, unambiguous publication date, and to some extent, timeliness. Some companies have tried to improve access by making their journals available over a well known website. For example, *IBM Technical Disclosure Bulletin* is available via the Delphion patent search site (www.delphion.com) and the Xerox version is available on a dedicated Xerox-owned website (www2.xerox.com / research / xdj).

Occasional publications. Occasional publications include periodic reports (isolated or part of a series) or any of the "white paper"-type of articles that are becoming common, especially in the technical areas of company websites. These publications may be paper or electronic (often in facsimile format such as PDF files), so establishing a publication date is relatively straightforward. Yet when in electronic format, they suffer the same problem as other Web-based materials, in that they are not as readily accessible to, or viewed by, the target audience. Unlike regular series, which raise awareness of an organization's activities, occasional publications provide insufficient incentive for users to regularly monitor the published output of the originating organization.

Gray literature. The term "gray literature" covers the ephemeral literature published within an organization, ranging from information leaflets, package inserts, flyers, and press releases to short reports and self-published articles. Although the organization has complete control over the form and timeliness of the materials, gray literature's effectiveness in defensive publishing is usually undermined by the lack of a recorded date of publication and the absence of systematic archiving that could enable interested parties to retrieve such publications. Gray literature therefore has little usefulness in defensive publishing (although it is possible for a piece of gray literature to form an accidental disclosure that may come back to haunt the company at a later date). There have been instances when such publications are raised as prior art, but generally they are difficult to track down. It is worthwhile for organizations to systematically archive all their own materials, preferably on a CD-ROM or another permanent storage medium, in case they need to produce an example as evidence.

Third-party publishing

The major benefit of using an established, third-party publication outlet is that it ensures an independently verifiable date of publication. To some extent, it also addresses the question of accessibility, as many third-party publishing sources are systematically monitored by the target audience. However, the creating organization usually loses a degree of control over timeliness and, to some extent, over the form of publication. There will also probably be additional costs involved in using a third-party route.

Commercial public disclosure. A number of long-established publications, mostly paper, specialize in rapid invention disclosure. Perhaps the best known is the journal *Research Disclosure,* which publishes monthly. This journal enables the originator to obtain an unambiguous date of release into the public domain and usually complete control over content, since the publisher applies no editing. Full details on how to use *Research Disclosure* are found at their website (www.researchdisclosure.com). Disclosure can be in any language and can also be anonymous. The journal is sufficiently well established as a source of prior art that it is abstracted by a number of major databases, including *Chemical Abstracts* and (until recently) the *Derwent World Patent Index.*

A more recent mechanism for commercial public disclosure is the corporate organization IP.com, which produces a printed journal and companion website (www.ip.com). The website offers a comprehensive public disclosure service, with all electronic entries being notarized, digitally fingerprinted, and tracked for continuity of presence in their system. This is a fee-based service. Any language can be used, although English is dominant. The organization further provides a service to companies that need secure archiving of invention records, such as laboratory notebooks. IP.com has concluded agreements with major patent-granting authorities to ensure that the contents of its website are included in the prior art searches conducted by patent examiners, ensuring excellent accessibility.

Peer-reviewed literature. The main drawback to using the peer-reviewed literature is that the originating organization may have little control over the actual date of publication. The review process and the publication cycle of many journals means that an article can take many months before actually appearing. In addition, the journal may require submission in a specific language or be unable to handle material of certain types (such as large volumes of experimental data or genetic sequences). There may be confidentiality risks in releasing information to reviewers before publication, although reputable journals should have this under control. The publisher will almost certainly require copyright on the article, often including rights of reproduction in other forms, such as abstracts on a website. Some journals have page fees for submission, adding to the cost of using this method of disclosure. The biggest advantage in using the peer-reviewed literature is that it

provides extremely good access via established literature databases, with a fairly unambiguous publication date, although some journals carry only a cover date of the month or quarter concerned, which may not be precise enough to satisfy the originator.

An intermediate step towards full peer-reviewed journal articles is the use of poster sessions or oral presentations at a conference. These generally receive good publicity at the time, and the originator retains a large degree of control over the content. However, although such presentations establish an unambiguous publication date, it is difficult to ensure that the information will effectively be made available for retrospective searching. Conference documents tend to be poorly indexed in commercial databases and do not form a primary source of search material for patent examiners. Only a few major conferences, or those in selected subject areas, receive indexing that would be adequate to ensure good disclosure. Furthermore, if an organization has to wait until an appropriate conference is held, it has less control over the timeliness of the disclosure.

National publications. An official method of disclosure is via a special publication series of the US Patent and Trademark Office called *Statutory Invention Registrations* (SIRs). These are principally used by US federal agencies as a means of disclosing inventive material, but they are open to anyone to use. As with all US patent office publications, contributions must be in English. There is no copyright on materials published as SIRs. They can be filed at the US Patent and Trademark Office in their own right, or they can be used as a last resort by applicants who have had their patent application rejected but still wish to ensure that the material enters the public domain. Since US patent law changed to require publication of most US patent applications 18 months after the date of application, this latter option is likely to be used less in the future.[7] The entire SIR archive is available for searching on the US Patent and Trademark Office website and is also included in a number of commercial databases, ensuring good accessibility. SIRs are categorized according to the US patent classification scheme, which further improves the chances of their being located, especially by patent examiners and others who search the patent literature.

The deferred examination process used by many patent offices today provides another excellent, though often overlooked, means for low-cost publication of technical data. It is quite permissible to pursue a patent application up until the first publication (unexamined) of the case and then to withdraw. The document then remains in the public domain and will have a corresponding official record in the patent registers. In most countries, the patent application fee structure separates the early filing fee from the much larger substantive examination fee; and the latter fee will not be incurred at all if the application is withdrawn after early publication. The fees at the early stages of application are often very low, comparable even to self-publication costs. The originating organization gets a predictable publication time frame, typically around 18 months after filing, with early notification from the patent office when the case is due to be published. This means that disclosure is not as timely as in some other methods, but once an application has been published, it has an unambiguous publication date. The bibliographic record is entered into many mainstream databases for good accessibility and it can be associated with searchable full-text. Like the SIRs applications are categorized using a recognized patent classification system, further ensuring that they can be retrieved in official searches.

The less attractive side of using this route for disclosure is that a formal patent application must be drafted, which will entail attorney costs even if the applicant has no intention of pursuing the case to grant. Further, the choice of patent office will to some extent dictate the language of the disclosure, although under international filing systems the applicant has a choice of seven official languages. One further major advantage of this method of disclosure is that the applicant can still opt to pursue the application through to grant. The effect of other forms of defensive disclosure appearing earlier than an unexamined patent application cannot be reversed. With a patent application, however, the applicant typically has two years after filing to decide whether to proceed to grant. If circumstances change and the applicant prefers to seek a patent rather than withdraw the case, they will not have jeopardized their own chances by an irrevocable earlier disclosure.

Other IP titles. The final method of defensive disclosure is using an alternative intellectual property title, such as a utility model system, short-term patent, or innovation patent. Many countries offer such forms of "second-tier protection" in parallel to their regular patent system for research products and innovations. One of the best known is the German *Gebrauchsmuster* (utility model) system. The type of materials eligible for utility model protection might be different than for regular patents, so professional advice should be sought before using this route. In general, applications for alternative intellectual property titles are examined less rigorously than patent applications—sometimes not at all. Typically they are published within three to six months rather than the 18 months required for a regular patent. Once published, the standard of official record is the same as for a patent, although the coverage of these documents in commercial databases is generally not as good. Nonetheless, they are an excellent means of obtaining effective disclosure of technical data for minimal cost, and they do imply certain legal rights.

While utility model rights are certainly weaker than patents, a well drafted utility model will ensure the holder a degree of control over the subject matter. As noted, with

7. Patent applications made in the US Patent and Trademark Office will be published 18 months after the application date, unless the applicant swears that no additional filings will be made, in jurisdictions where publication is procedural. This has the practical effect of allowing the applicant to keep a US patent application confidential if the applicant is putting forward a US application only.

Table 1: Comparison of Defensive Publication Mechanisms

	Form	Accessibility	Language	Timeliness	Publication date	Cost	Anonymity	Rights
Self-publication								
Company publicity materials	complete control but variable verifiability	moderate to poor	no restriction	complete control	variable, depends on internal information policy	low to moderate	not possible	copyright only
Company series	as above	moderate	no restriction	complete control	as above	low	not possible	copyright only
Occasional publications	complete control, good verifiability	generally poor	no restriction	complete control	as above	moderate	not possible	copyright only
Gray literature	complete control, moderate verifiability	generally poor	specific language may be required, depending on the target audience	complete control	as above	low	not possible	copyright only
Third-party publication								
Commercial research disclosure publication	very flexible	good to very good	no restriction	typically within one month	externally verified, reasonable precise	low to moderate	possible	none if submitted anonymously
Stationary invention registrations	must comply with official standards	very good	English only	rapid within a few months	externally verified, reasonable precise	moderate	not possible	none
Peer-reviewed journals	may be subject to substantial editorial control	good	depends on editorial policy of the journal	highly variable, can be many months	variable, may be difficult to verify	variable	not possible	none – surrendered to publisher
Unexamined patent application	must comply with official filing requirements	very good	official language(s) accepted only	typically 18 months	externally verified, absolutely precise	moderate	not possible	potential for full patent rights
Other IP title	must comply with official filing requirements	good	official language accepted only	variable, usually three to six months	externally verified, absolutely precise	low	not possible	some legally enforceable rights against infringers
IP.com	very flexible, rigorous validation checks applied	very good	no restriction, but English favored	very rapid	externally verified, absolutely precise	moderate to high	possible	none if submitted anonymously

Key to column headers:

Form: amount of control that the originating organization retains over content, medium of distribution, verification of origin, and continuity of access.

Accessibility: ease of access to the disclosure by the appropriate research community and the patent authorities.

Language: restrictions on the language in which the information can be disclosed.

Timeliness: degree of control that the originating organization has over the timing of entry into the public domain.

Publication date: degree of certainty on the unambiguous date on which a disclosure entered the public domain.

Cost: official or other fees that the originating organization may incur in preparing publication.

Anonymity: whether the route of disclosure allows for anonymous publication.

Rights: any legal rights that the defensive publication may confer on the originating organization.

other forms of defensive disclosure the originator forfeits any rights of control as soon as the publication is made available to the public. But both patent applications and utility models reserve the option for the originator to exert some influence over potential infringers. Since utility models are designed for smaller businesses and less significant inventions, the costs of application are also considerably lower than for patents.

Conclusion

This Briefing Paper has provided an overview of defensive publishing for institutions weighing the options available for publishing research results and disclosing innovations. By way of conclusion, table 1 sets the various forms and methods side by side, enabling readers to make quick comparisons of the different mechanisms of defensive publication. The table is meant as an aid to decisions on which method might best serve a particular need.

In short, if the main concern is to reach a specific audience but there is little interest in using the publication as prior art to trigger the rejection of a patent claim, then self-publication is likely the most cost-effective means of disclosure. But other options should be considered if an organization's main goal in publishing is to defeat a potential patent application. In this case, using a commercial company that specializes in publications that reach the attention of most patent examiners is the recommended course.

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